

(No Model.)

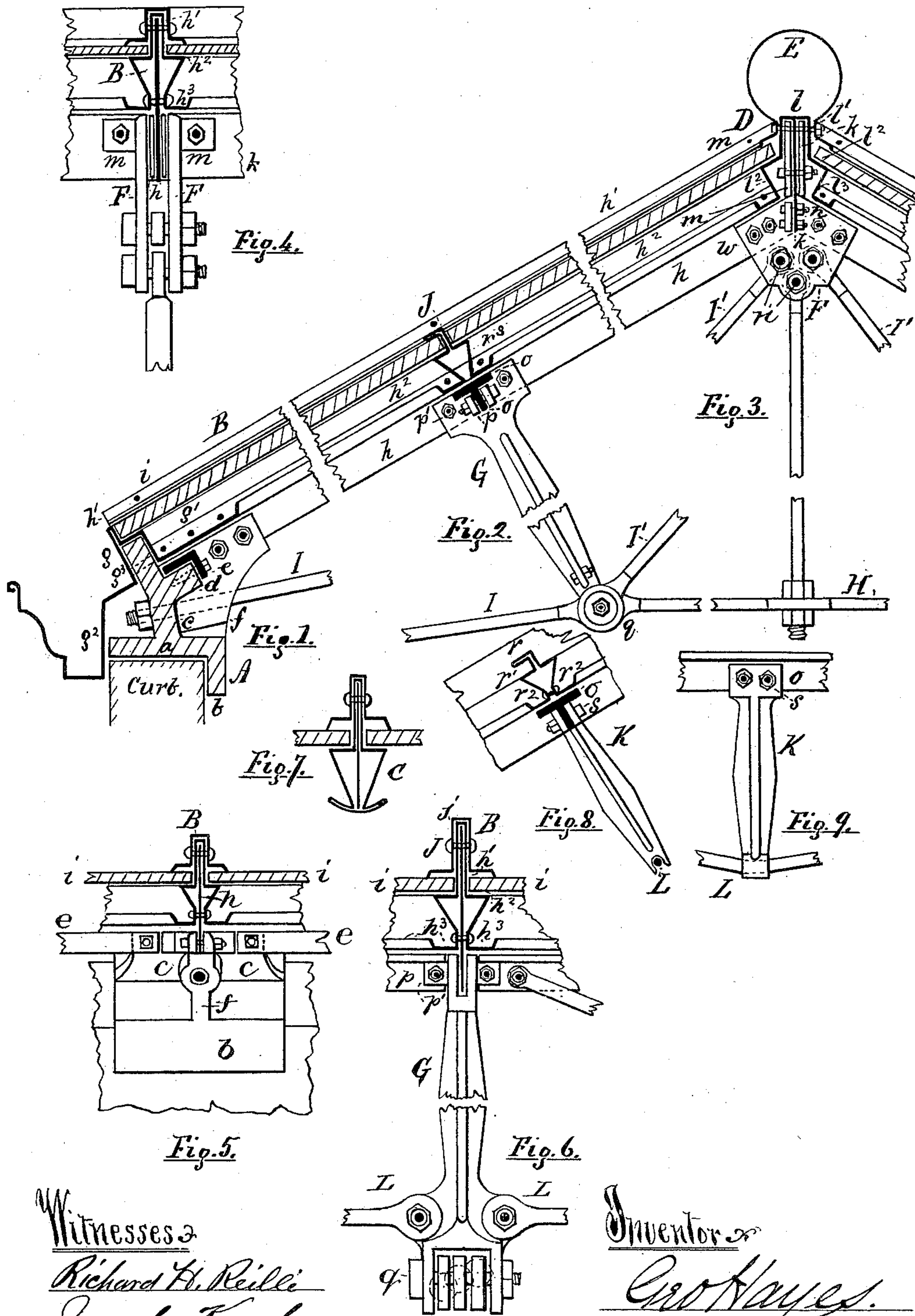
2 Sheets—Sheet 1.

G. HAYES.

GLAZED METALLIC ROOF AND SKYLIGHT.

No. 299,386.

Patented May 27, 1884.



Witnesses:
Richard H. Reilly
Jacob Koch

Inventor:
Geo Hayes.

(No Model.)

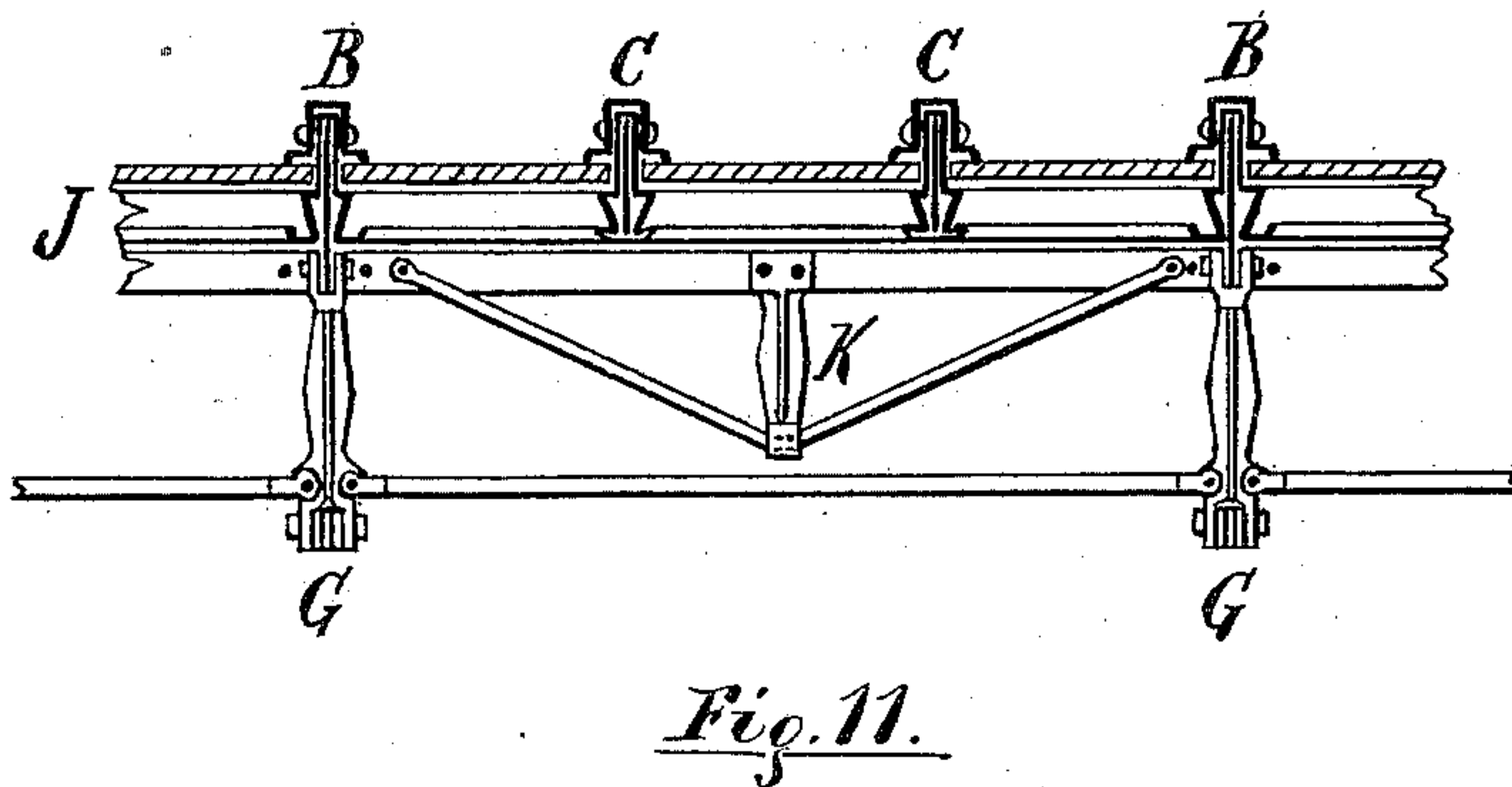
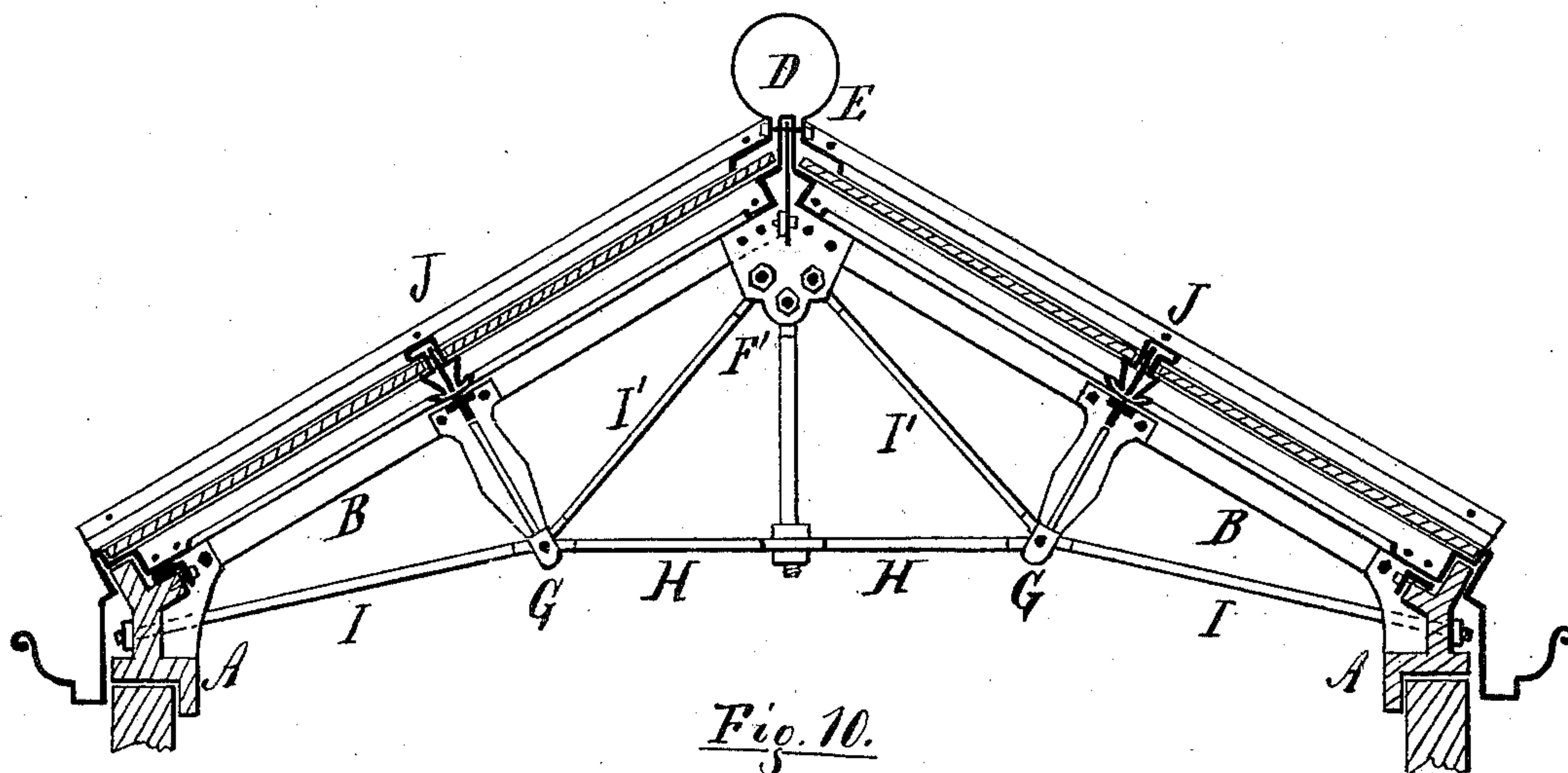
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UNITED STATES PATENT OFFICE.

GEORGE HAYES, OF NEW YORK, N. Y.

GLAZED METALLIC ROOF AND SKYLIGHT.

SPECIFICATION forming part of Letters Patent No. 299,386, dated May 27, 1884.

Application filed May 28, 1883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE HAYES, a resident of the city, county, and State of New York, have invented certain new and useful
5 Improvements in Glazed Metallic Roofs and Skylights, of which the following is a specification.

My improvements are more especially applicable to glazed metallic roofs and skylights
10 of great span, such as railroad-depot roofs, conservatories, exhibition-buildings, large halls, factories, warehouses, &c., but are also useful wherever great strength combined with lightness is requisite; and they consist, first,
15 in the peculiar construction of the "shoe" which receives and sustains the foot of the main rafters of my structure, and holds the tie-rod of the main truss, and also forms a support for a base-plate which holds and sustains the intermediate rafters of my structure.
20 This shoe is of solid iron, and is formed with a base portion or foot adapted to rest on a curb of the building, an interior and downwardly-projecting flange fitting inside the curb to hold
25 the shoe in place, and an upwardly-projecting flange or vertical portion with an inward-projecting flange to receive a base angle-iron plate. The shoe is adapted in form to receive rafters and tie-rods, as well as a base-
30 plate and other parts of the roofing and gutters. It also has an inwardly-projecting portion adapted for bolting to the core-plate of the main rafters, so that the whole may be thoroughly secured.

35 It consists, second, in the peculiar combination of a ridge-block, which is adapted to and used for holding the upper end of main rafters together, with a ridge-plate which it holds and sustains, and its casing and cap, to which plate
40 are attached the upper ends of intermediate rafters; and also to this ridge-block are attached and secured the upper ends of the tie-rods, &c., of the main truss, the "block" being adapted to receive the same, and bolted to
45 the core-plate of the main rafters of both slopes of the roof. The ridge-block is also adapted to receive rods crosswise and lengthwise the building, and is provided with bolt-holes for securing the same thereto.

50 It consists, third, in the combination of rafter, "ridge-block," and shoe, the rafter having a core-plate partially clothed or incased

with sheet metal bent to form a ridge saddling the core-plate, and open rabbets for reception
of glass plates, and gutters beneath the rabbets to catch leakage and drip of condensation and carry down the same. The core-plate is deeper (or extends down lower) than the sheet-metal inclosure, to give strength and facility for securing other parts of the roof
60 thereto, such as the shoe and ridge-block hereinbefore mentioned.

It consists, fourth, in an arrangement of braces, brace-rods with shoe, and ridge-block, in combination with main rafters forming a
65 main truss.

It consists, fifth, in combination with shoes, ridge-blocks, rafters, purlins, and purlin-brace, of a rod running between purlin-braces, stiffened by a spur-brace extending downward
70 from the purlin to the rod, and therewith forming a truss arranged transversely to the main truss.

It also consists, sixth, in the combination of members forming the ridge of the roof, consisting of ridge-block, ridge-plate, ridge bar
75 or casing, and ridge-cap.

In the accompanying drawings, Figure 1 represents in cross-section the shoe which supports the lower end of main rafters, base-
80 frame, base-gutters, (inside and outside,) base angle-iron, and receives the tie-rods of main truss. Fig. 2 represents a cross-section through a cross clip or bar, section of purlins, and side view of purlin-brace and tie-rod connections, with portions of rafters. Fig. 3 represents a cross-section through the ridge portion of the roof, giving in section the ridge-plate, ridge-bar, with its gutters and glazing, also face view of ridge-block, upper ends of
85 main rafters, tie-rods, and truss-connections. Figs. 1, 2, and 3 are disjointed portions of a roof in section, shown in their relative positions up the slope. Fig. 4 is a view giving a cross-section of one of the main rafters, glazing, and capping near the ridge of the roof,
90 looking toward the same, showing by horizontal lines the face elevation of a portion of the ridge-bar, (without its capping,) the lower part of ridge-plate as it extends below the
100 sheet-metal rabbets and ridge-gutter, also showing edge view of ridge-block plates, illustrating its connection by means of lateral flanges and bolts to the ridge-plate, also show-

ing the upper ends of truss-rods, to illustrate the manner of securing the same between the two plates comprising the ridge-block. Fig. 5 is an inside face view or elevation of the shoe—the rafter and glazing in section. Fig. 6 is a similar view of the purlin-brace, the side of which is shown in Fig. 2. Fig. 7 is a cross-section of an intermediate rafter. Fig. 8 is a side view of the brace of the lengthwise truss—the rafter above and purlin in section. Fig. 9 is an inside face view of the same. Fig. 10 is a cross-section of a roof, both slopes being shown on small scale. Fig. 11 is a face view of the lengthwise truss—the parts above, such as rafters and glass, in section.

A represents the shoe at the base of the main rafters of the roof. *a* is the bed portion thereof, resting on the curbing, and *b* is a downwardly-projecting flange fitting inside the curb, keeping the shoe firm.

c is an upwardly-projecting portion, and *d* is an inwardly-projecting flange about midway the height of the portion *c*. The flange *d* is adapted to receive an angle-iron plate, *e*, forming a support to the intermediate rafters.

f is a portion of the shoe projecting inward to strengthen the flange *d*. The upper part of the portion *c* receives and is incased by the sheet-metal base-frame *g* of the roof, into which is formed an interior base-gutter, *g'*, which connects with the gutters of all the rafters and receives the water of leakage or condensation therefrom. An outside gutter connected therewith is shown at *g''*, and communication from inner base-gutter to outer base-gutter is had through apertures or perforations arranged intermediate (or between) the rafters where desired. Dotted lines at *g'''* show the direction of these apertures. The angle-iron plate *e* is bolted to the flange *d*, as shown, through the downward flange of plate *e*.

B represents the main rafters of the roof, consisting of core-plate *h* and a sheet-metal casing or bar bent to form ridge *h'*, rabbets *h''*, and lateral gutters *h'''*. The glass is marked *i*, and a cap saddling the bar or ridge *h'* of casing or bar is shown at *j*. The cap has lateral flanges with turned-down edges, and covers the joining of glass to ridge of rafters, to prevent leakage and secure the glass in position. It is secured to the ridge of the bar by rivets passed through both. The intermediate rafters are shown in section, Fig. 7, (marked C.) They differ from the main rafters in respect to the core-plate principally, it not extending below the bottom of the bar, the sheet of metal comprising the bar completely inclosing the core-plate, and the bottom gutters being curved. However, I do not confine myself to this form especially, as these rafters may be made like the others or in any other suitable form.

D represents the ridge of the roof, consisting of a ridge-plate, *k*, a casing or ridge-bar of sheet metal, *l*, bent to form ridge portion *l'*, open rabbets *l''*, and gutters *l'''*. A cap, E, cov-

ers the whole and renders the joining of the glass therewith water-tight. A ridge-block, F, composed of two wrought-iron plates bolted together, is here connected to the ridge-plate *k* by means of flanges *m*, through which bolts are passed, as shown, and through the ridge-plate, securing the same properly together. The ridge-block F is secured to the core-plate *h* of the rafters by bolts at *n*, and at *n'* are secured thereto by bolts the braces and rods of the main truss. The casing *l* of the sheet-metal ridge-bar is also secured to the ridge-plate *k* by bolts through them both from side to side, as shown. This ridge-block F forms the connecting medium at the ridge, whereby the roofing and trussing is all securely connected in a strong and substantial manner.

G represents the purlin-brace, located intermediate between the ridge and base of roof. The purlin, which is made of T-iron, is shown at *o*, and is secured to the upper end of the brace G by bolts through it and lateral flanges of the brace at *p*. The upper end of the brace is also bolted to the core-plate of the rafter at *p'*. At *q*, to the lower end of this brace, are secured by bolts the tie-rods and brace-rods of the main truss, and also on each side, at *r*, the rods of the transverse truss.

At H is shown the center tie-rod extending between the purlin-braces G, and on each side, at I, is shown a side rod, extending from each purlin-brace G to and through the side or base shoe, A, one end being bolted to the brace G, and its other end being secured by a nut threaded on the outside of the shoe. The main brace extends down from the ridge-block F (to which its upper end is bolted) to and through the main or center tie-rod, H, and is secured by a nut threaded on its lower end below the tie-rod.

At I' is shown a brace-rod, (its upper end secured to ridge-block F by bolts,) running from the same to purlin-brace G, its lower end being bolted thereto, as shown in Fig. 10. Above the purlin *o* is shown a cross-bar or clip, J, extending from bar to bar, and provided with rabbet *r'''* on its upper side, groove *r'* on its lower side, and below gutters *r''*. It may be used with or without a core-plate, and is made of sheet metal folded into the shape shown. It provides for the butt-joining of the glasses, the joining of which supports and provides against leakage. There may be as many of these cross-clips as necessary, and they are used wherever the joining of glass plates is necessary down the slope. The gutters at the ridge connect and discharge into the sloping gutters of the rafters, and the gutters of the cross-clips also, and the gutters of the sloping rafters discharge into the inside base-gutter, from whence, by means of suitable apertures intermediate of the rafters, the accumulated water is discharged to the outer gutter, or any other suitable place.

At K is shown the spur of the transverse truss, the rod L of the truss passing under it

from the purlin-braces, as shown in Fig. 11. This spur K is bolted to the purlin *o* at *s*, as shown in Figs. 8, 9, and 11.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The shoe A, constructed with bed portion *a*, flange *b*, vertical portion *c*, and flange *d*, all combined substantially as shown and described.
2. In combination with the shoe A, the angle-iron base-plate *e*, substantially as shown and described.
3. In combination with shoe A, the inner gutter, *g'*, outer gutter, *g''*, and casing comprising base-frame *g*, essentially as shown and described.
4. In combination with ridge-block F, constructed as shown, the ridge-plate *k*, and cas-

ing or ridge bar *l*, and cap E, all constructed, arranged, and combined substantially as shown and described.

5. In combination with ridge-block F and shoe A, the rafters B, purlin-brace G, main brace-rod H, and tie-rods I and I', all combined substantially as shown and described.

6. In combination with shoes A, base angle-iron *e*, ridge-block F, ridge-plate *k*, main rafters B, purlin-brace G, rods H and I, brace-rods I', rods L, purlins *o*, intermediate rafters, C, and spur K, all combined, constructed, and arranged substantially as shown and described.

GEO. HAYES.

Witnesses:

JACOB KOCH,
CHARLES HAYES.